Jayesh Foundation Kalwan

JAYESH FOUNDATION SCHOLARSHIP EXAMINATION 2022

Descriptive Paper (PCM)

Time : 3:00 hrs. **Max. Marks : 100**

PHYSICS

General Instructions

- All questions are compulsory.
- This question paper has three sections: Section A ,Section B & Section C,
- Section A contains five questions of one mark each, Section B contains four questions of two marks each and Section C Contains four Questions of three marks each.

Section (A)

1. Is it possible ever for a silver wire to have a higher resistance than an iron wire? Comment on your reply

2. What is the function of lens of human eye?

3. How many times the direction of current in the coil of an electric motor changes in one complete rotation?

4. The refractive index of diamond is 2.42. What is the meaning of this statement?

5. What are the electrical specifications of the domestic supply in India?

Section (B)

6. Can magnification be negative for a convex mirror? If not, why?

7. Suggest the suitable lens for correcting vision of a person whose near point reads away to 75cm.

8. For the same current, the heating element of an electric iron become so hot but the connecting wires remain cold. Why?

9. A 2 Coulomb charge is carried from a point A which is at 20 Volt to another points B. If the work done in the process is 100 Joule, calculate the potential of point B.

Section (C)

10. An object, 4.0 cm in size, is placed at 25.0 cm in front of a concave mirror of focal length 15.0 cm. At what distance from the mirror should a screen be placed in order to obtain a sharp image? Find the nature and the size of the image.

11. What do you mean by myopia?

(a) A person suffering from myopia wants to see movie in cinema hall. Will he be able to see the movie properly with bare eyes?

(b) Which lens should he use to correct the vision, if his far point is 1.2m?

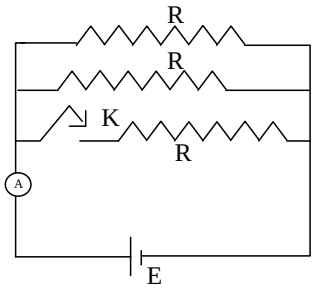
(c) What are the possible reasons that cause short sightedness?

12. A coil of insulated copper wire is connected to a galvanometer.

What will happen if a bar magnet is (i) pushed into the coil, (ii) withdrawn from inside the coil, (iii) held stationary inside the coil?

13. Consider the given electrical circuit.

When the key 'K' was left open, the reading of ammeter was 6A. What will be the reading of the same ammeter if the key 'K' is closed?



CHEMISTRY

Each question carries 5 marks

1.

(a) Define a balanced chemical equation. Why should an equation be balanced?

(b) Write the balanced chemical equation for the following reaction:

(i) Phosphorus burns in presence of chlorine to form phosphorus pentachloride.

(ii) Burning of natural gas.

(iii) The process of respiration.

2.

(a) Write one example for each of decomposion reaction carried out with help of

(i) Electricity (ii) Heat (iii) Light

(b) Which of the following statements is correct and why?

(i) Copper can displace silver from silver nitrate

(ii) Silver can displace copper from copper sulphate solution.

3. An element X which is a yellow solid at room temperature shows catenation and allotropy. X form two oxides which are also formed during the thermal decomposition of ferrous sulphur crystals and are the major air pollutants.

(a)Identify the element X.

(b)Write the electronic configuration of X.

(c)Write the balanced chemical of equation for the thermal decomposition of ferrous sulphate crystals.

(d)What would be the nature (acidic/ basic) of oxides formed?

(e)Locate the position of the element in the Modern Periodic Table.

4. An organic compound A is widely used as a preservative in pickles and has a molecular formula $C_2H_4O_2$. This compound reacts with ethanol to form a sweet smelling compound B.

(a) Identify the compound A.

(b) Write the chemical equation for its reaction with ethanol to form compound B.

(c) How can we get compound A back from B.

(d) Name the process and write the corresponding chemical equation.
(e) Which gas is produced when compound A reacts with washing soda? Write the chemical equation?

5.

(a) Mention the pH range within which our body works. Explain how antacids give relief from acidity. Write the name of one such antacid.
(b) Fresh milk has a pH of 6. How does the pH will change as it turns to curd? Explain your answer.
(c) A milkman adds a very small amount of baking soda to fresh milk. Why does this milk take a longer time to set as curd?
(d) Mention the nature of toothpastes. How do they prevent tooth decay?

MATHEMATICS

Instructions:

- This paper contains 3 sections.
- **Section A** contains **5 Questions** of **2 Marks** each.
- **Section B** contains **5 Questions** of **3 Marks** each.
- **Section C** contains **5 Questions** of **5 Marks** each.
- There is no internal choice in any section.
- All Questions are compulsory.

Section (A)

1. A dealer sells an article for Rs.24 and gains as much percent as the cost price of the article. Find the cost price of the article.
2. Solve : $15x + 17y = 21; 17x + 15y = 11$
3. For what value of p are $2p + 1, 13, 5p - 3$, three consecutive terms of an A.P.?
4. Areas of similar triangles are 98 sq. cm and 128 sq. cm. Find the ratio between the lengths of their corresponding sides.
5. For a $\triangle PQR$ with points P, Q and R lying on a circle, if RP is the diameter of the circle and $PQ = 5$ cm and $QR = 12$ cm. Find the radius of the circle.

Section (B)

6. Twice the son's age in years is added to the father's age, the sum is 70. But if twice the father's age is added to the son's age, the sum is 95. Find the ages of father and son respectively.
7. A motorboat whose speed is 18 km/h in still water takes 1 hour more to go 24 km upstream than to return downstream to the same spot. Find the speed of the stream.
8. Divide 20 into four parts which are in A.P. and such that the ratio of the product of the first and fourth to the product of the second and third is to 2:3. Now find the largest term in those four terms?
9. Cards numbered 1 to 30 and put in a bag. A card is drawn at random from this bag. Find the probability that the number on the drawn card is (i) not divisible by 3, (ii) a prime number greater than 7, (iii) not a perfect square number.

10. Find the length of the side, perimeter and area of an equilateral triangle whose height is $\sqrt{3}$ cm.

Section (C)

11. A circus tent is to be erected in the form of a cone surmounted on a cylinder. The total height of the tent is 49 m. Diameter of the base is 42 m and height of the cylinder is 21 m. Find the cost of canvas needed to make the tent, if the cost of canvas is Rs.12.50/m^2. (Take $\pi = \frac{22}{7}$)

12. Distribution below gives weights of 30 students of a class. Find the median weight of the students.

Weight (in kg)	40-45	45-50	50-55	55-60	60-65	65-70	70-75
Number of Students	2	3	8	6	6	3	2

13. Find the value of $(1 + tan\theta + sec\theta)(1 + cot\theta - csc\theta)$ (*csc means cosec).

14. The angle of elevation of a jet plane from a point on the ground is 60°. After a flight of 30 seconds the angle of elevation changes to 30°. If the jet plane is flying at a constant height of $3600\sqrt{3}$ m, find the speed of the jet plane.

15. If the 9th term of an A.P. is zero, then prove that the 29th term is double the 19th term.